WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for

WESTERN UNITED STATES
Including Columbia River Drainage in Canada

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE
Collaborating with
CALIFORNIA DEPARTMENT of WATER RESOURCES
and
BRITISH COLUMBIA DEPARTMENT of
LANDS, FORESTS and WATER RESOURCES

AS OF
MAR. 1, 1966

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season as they affect runoff will add to be an effective average. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data or reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

Listed below are water supply outlook reports based on Federal-State-Private Cooperative snow surveys. Those published by the Soil Conservation Service may be obtained from Soil Conservation Service, Room 507, Federal Building, 701 N. W. Glisan, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	LOCATION	COOPERATING WITH
RIVER BASINS			
Western United States	Monthly (Feb.-May)	Portland, Oregon	All Cooperators
Basic Data Summary	October 1	Portland, Oregon	All Cooperators
STATES			
Alaska	Monthly (Mar.-May)	Palmer, Alaska	Alaska S.C.D.
Arizona	Semi-Monthly (Jan.15 - Apr.1)	Phoenix, Arizona	Salt R. Valley Water Users Assoc. Ariz. Agr. Exp. Station
Colorado and New Mexico	Monthly (Feb.-May)	Fort Collins, Colorado	Colo. State University Colo. State Engineer N. Mex. State Engineer
Idaho	Monthly (Jan.-June)	Boise, Idaho	Idaho State Reclamation Engineer
Montana	Monthly (Jan.-June)	Bozeman, Montana	Mont. Agr. Exp. Station
Nevada	Monthly (Jan.-May)	Reno, Nevada	Nevada Dept. of Conservation and Natural Resources - Division of Water Resources
Oregon	Monthly (Jan.-June)	Portland, Oregon	Oreg. State University Oregon State Engineer
Utah	Monthly (Jan.-June)	Salt Lake City, Utah	Utah State Engineer
Washington	Monthly (Feb.-June)	Spokane, Washington	Wn. State Dept. of Conservation
Wyoming	Monthly (Feb.-June)	Casper, Wyoming	Wyoming State Engineer

PUBLISHED BY OTHER AGENCIES

REPORTS	ISSUED	AGENCY
British Columbia	Monthly (Feb.-June)	Water Resources Service, Dept. of Lands, Forest and Water Resources, Parliament Bldg., Victoria, B.C., Canada
California	Monthly (Feb.-May)	Calif. Dept. of Water Resources, P.O. Box 388, Sacramentd, Calif.

USDA-SCS-PORTLAND, OREG. 1965

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ISSUED

MARCH 1, 1966

The Soil Conservation Service coordinates snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Corps of Engineers, Forest Service, National Park Service, Geological Survey, and other Federal Agencies, Departments of State Government, Irrigation Districts, Power Companies, and others.

The Department of Water Resources coordinates snow surveys in California.

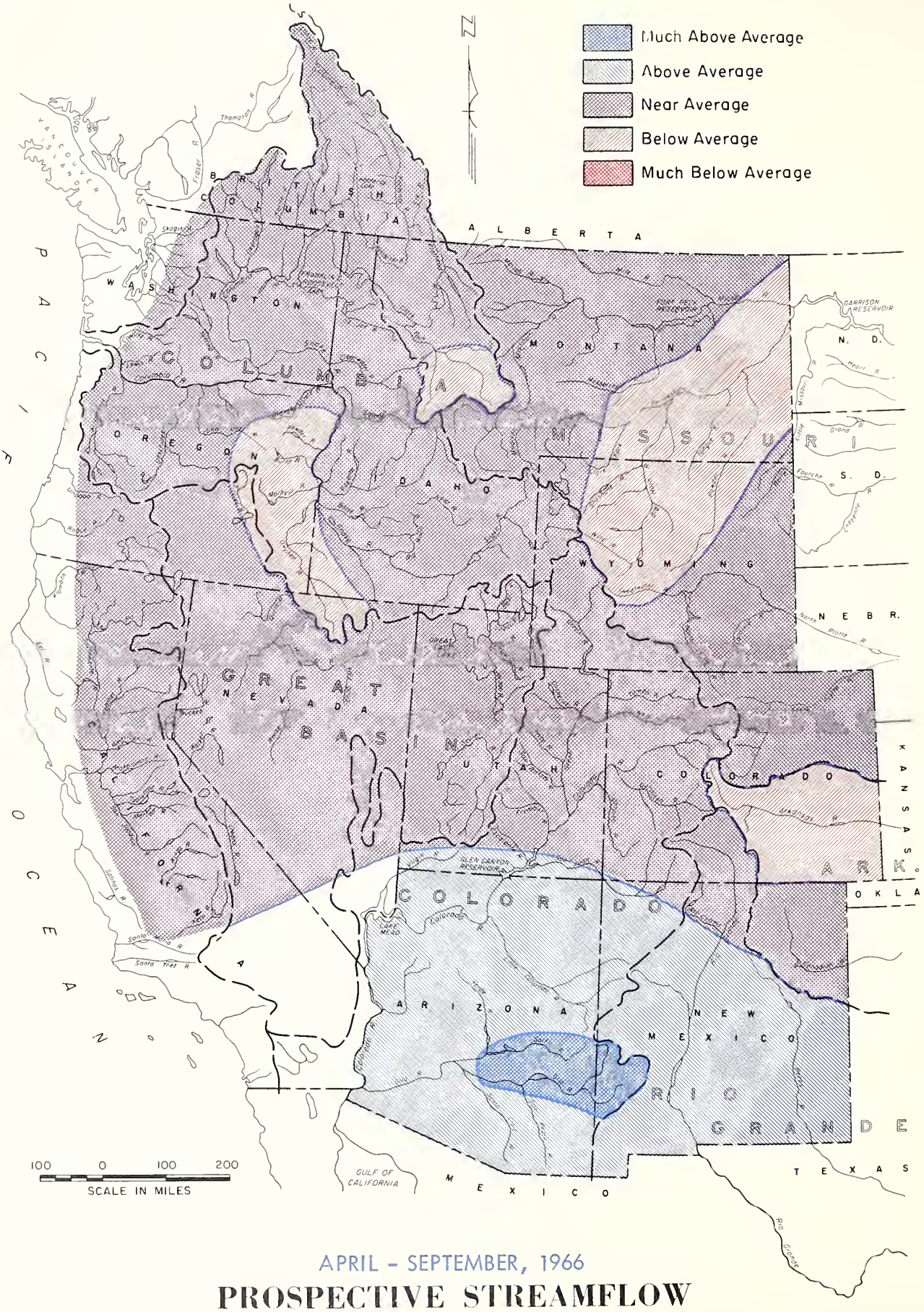
The Water Resources Service, Department of Lands, Forests, and Water Resources directs snow surveys in British Columbia.

This report was prepared by the Water Supply Forecasting Branch, Engineering Division, Soil Conservation Service, from data supplied by Snow Survey Supervisors of the Soil Conservation Service in the States of Arizona, Colorado and New Mexico, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming.

Data from California was supplied by the Chief, Water Supply Forecast and Snow Surveys Unit, Department of Water Resources.

Data from British Columbia was supplied by the Chief, Hydrology Division, Water Investigations Branch, Department of Lands, Forests and Water Resources.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
D. A. WILLIAMS, ADMINISTRATOR



APRIL - SEPTEMBER, 1966

PROSPECTIVE STREAMFLOW

AS OF MARCH 1, 1966

WATER SUPPLY OUTLOOK

As of March 1, 1966

WATER SUPPLIES FOR 1966 IN WESTERN STATES WILL BE GENERALLY ADEQUATE. STREAMFLOW FORECASTS TEND TO BE SLIGHTLY BELOW AVERAGE EXCEPT FOR ARIZONA AND NEW MEXICO. HIGH CARRYOVER STORAGE WILL ASSURE SUPPLEMENTAL WATER.

Even with some decline in mountain snowpack and streamflow forecasts during February, water supply outlook remains good for most western areas. Streamflow forecasts generally range from 80 to 100 percent of average. Flows of lesser amounts are in prospect for parts of the Yellowstone Basin in Montana and Wyoming, the Arkansas in Colorado and in Snake River tributaries in eastern Oregon, southern Idaho and northern Nevada. Snowmelt season runoff is expected to be well above average in Central Arizona.

The high runoff year of 1965 left reservoirs with more than usual amount of water in storage. If snowfall for the remainder of the season is reasonably close to average, the combination of storage and streamflow is expected to provide reasonably adequate water supplies. If the present trend toward a deficiency in snowfall persists there will be a substantial depletion of storage on the heavier demand streams during the 1966 irrigation season.

The California Department of Water Resources reports that March 1 conditions reflecting the status of water supply are not as favorable as reported one month ago. Precipitation during the past month was far below average on all major watersheds, approximately only 55 percent of normal for the entire state. Although the February increment was far below that normally expected, snowpack accumulation is still slightly above average for March 1. Runoff to date and storage in California's major reservoirs are also near normal. Thus, California water users are still justified in looking forward to adequate supplies this season.

SNOWPACK

Snowfall to March 1 ranged from 70 to 100 percent of average for this date. The highest snowpacks, about twice average, are in the Salt and Gila drainages in Arizona and in small areas of the mountains of north central New Mexico. The snowpack on the headwaters of the Columbia River in Canada remains slightly above average. Deficiencies in seasonal snow accumulation are general east of the Continental Divide from Montana to southern Colorado. Isolated areas of relativelly low snow cover are the Upper Clark Fork in Montana, Snake River tributaries in southwestern Idaho and eastern Oregon, and on the Green River in Wyoming.

Except for west coast states and Arizona, mountain snowpack is much less than on this date in 1965, a heavy snow year.

STORAGE

Storage in irrigation and municipal reservoirs is well above average in all states except for the Yakima basin in Washington which represents a substantial improvement over a year ago. On the Missouri River main stem total storage is relatively high. While storage in Lake Mead on the Colorado River is below average, the total storage in the Colorado River basin increased substantially as a result of the high runoff of 1965. If upper basin storage was in Lake Mead, the contents would be near capacity and probably require spill before the snowmelt season. With deficient winter flows on the Columbia River power reservoirs have been lowered more than usual to meet generation demands.

Extremely favorable reservoir storage is present on the Gila, Salt and Verde in Arizona, the Snake River and tributaries in Idaho and in municipal reservoirs of the City of Denver.

STREAMFLOW FORECASTS

There has been a slight decline in streamflow forecasts from February 1 for the snowmelt period in most western streams. The flow of the Columbia is expected to be near average above its confluence with the Snake and slightly less than average at The Dalles, Oregon. With a deficiency in flow forecast on the Yellowstone, the forecast for the Missouri River at Williston, North Dakota is only three-quarters of average. In the Colorado River Basin only the San Juan is forecasted to flow above average among the major tributaries. Inflow to Glen Canyon reservoir is estimated to be about 90 percent of average for the snowmelt period. Except for the Central

SUMMARY OF SNOW WATER EQUIVALENT MEASUREMENTS MARCH 1, 1966

MAJOR BASIN AND SUB—WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE
MISSOURI BASIN		
Jefferson	47	70
Madison	50	75
Gallatin	47	73
Missouri Main Stem	57	79
Yellowstone	49	79
Shoshone	55	70
Wind	52	67
North Platte	63	76
South Platte	52	58
ARKANSAS BASIN		
Arkansas	52	70
Canadian	59	77
RIO GRANDE BASIN		
Rio Grande (Colo.)	80	107
Rio Grande abv. Otowi Bridge	81	111
Pecos	86	170
COLORADO BASIN		
Green (Wyo.)	46	75
Yampa - White	60	76
Duchesne	91	101
Price	71	87
Upper Colorado	70	79
Gunnison	80	90
San Juan	88	112
Dolores	80	109
Virgin	228	130
Gila	175	208
Salt	151	174
GREAT BASIN		
Bear	62	83
Logan	69	80
Ogden	64	97
Weber	62	84
Provo - Utah Lake	79	88
Jordan	48	83
Sevier	116	105
Walker - Carson	71	99
Tahoe - Truckee	75	97
Humboldt	86	75
Lake Co. (Oregon)	88	91
Harney Basin (Oregon)	70	74
UPPER COLUMBIA BASIN		
Columbia (Canada)	107	105
Kootenai	91	101
Clark Fork	64	82
Bitterroot	56	70
Flathead	73	94
Spokane	81	88
Okanogan	94	95
Methow	97	77
Chelan	103	86
Wenatchee	95	98

MAJOR BASIN AND SUB—WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE
SNAKE BASIN		
Snake above Jackson, Wyo.	60	80
Snake above Hiese, Idaho	56	78
Snake abv. American Falls Res.	55	77
Henry's Fork	66	93
Southern Idaho Tributaries	57	76
Big and Little Wood	44	78
Boise	41	66
Owyhee	74	75
Payette	48	91
Malheur	65	72
Weiser	58	88
Burnt	66	85
Powder	57	78
Salmon	51	80
Grande Ronde	57	84
Clearwater	74	80
LOWER COLUMBIA BASIN		
Yakima	84	87
Umatilla	86	104
John Day	66	90
Deschutes - Crooked	89	105
Hood	116	111
Willamette	118	129
Lewis	107	133
Cowlitz	84	97
PACIFIC COASTAL BASIN		
Puget Sound	92	94
Olympic Peninsula	110	88
Umpqua - Rogue	108	122
Klamath	88	100
Trinity	160	135
CALIFORNIA CENTRAL VALLEY		
Upper Sacramento	110	120
Feather	100	110
Yuba	90	100
American	80	100
Mokelumne	85	100
Stanislaus	90	105
Tuolumne	80	100
Merced	80	95
San Joaquin	85	95
Kings	110	110
Kaweah	100	100
Tule	100	90
Kern	90	85

Data for California Watersheds supplied by Dept. of Water Resources, and for British Columbia Watersheds by Dept. of Lands, Forests and Water Resources.

Average is for 1948-62 period. California Averages are for the period 1931-1960. *Based on Selected Snow Courses determined by Distribution within the Basin, Length of Record and Repetitive Monthly Measurement Schedules.*

Arizona areas, the flow of all streams is expected to be less than that for 1965. In those streams originating along the Continental Divide and in the interior basin streamflow will be substantially less than that which occurred a year ago.

Winter streamflow has been above average in all areas outside of the Columbia Basin.

MISSOURI BASIN

East of the Divide in Montana, snow accumulation in the mountains to date is about one-half of last year and near three-quarters of average on the Jefferson, Madison and Gallatin drainages. On the northern tributaries to the Missouri snowpack approaches average. On the headwaters of the Yellowstone snow conditions are similar to the Upper Missouri. Some late season shortages may occur on small tributaries without storage.

Soil moisture under the snowpack tends to be above average. Storage for irrigation is above average in most reservoirs and near average in multipurpose and water power reservoirs.

On Yellowstone tributaries in Wyoming, snow cover and streamflow forecasts are well below average. This area includes the headwaters of the Shoshone, Powell Basin tributaries, the Upper Wind River drainage and streams on both sides of the Bighorn Mountains. Storage is relatively good, but if water demands during the summer are high, there may be some water limitations on irrigated areas above Boysen Dam and along side streams below.

Streamflow on the North Platte is forecast at about three-quarters of average. Storage in the major reservoirs in Wyoming along with inflow should provide an adequate water supply in eastern Wyoming and western Nebraska at the cost of some depletion in storage.

On the South Platte in Colorado seasonal snowfall has been deficient. Soil moisture in the mountains under the snow is better than usual. Storage in local irrigation reservoirs and in the Colorado Big Thompson system have enough supplemental water to provide at least an average supply. Storage in Denver municipal reservoirs is unusually high with substantially increased capacity. If late season snowfall is deficient and summer demands are heavy some limited water shortage problems could develop.

ARKANSAS BASIN

Streamflow forecast for the Arkansas River and its tributaries in Colorado continues to be below average and much below that which occurred in 1965. However, storage carried over from snowmelt and rain floods of a year ago improves the water supply outlook. John Martin reservoir, which normally has very little water in storage, now is at conservation capacity. This approximates the total expected flow from snowmelt alone above the reservoir.

For the Canadian drainage in New Mexico snowfall has been relatively light to date, about one-half of that on March 1, 1965. A favorable storage situation in Conchas Reservoir provides for a favorable outlook for the Tucumcari Project.

RIO GRANDE BASIN

Reflecting the midwinter heavy storms centered in Arizona, snowpack on the Rio Grande drainage is slightly above average for this date. Forecasts of streamflow into the San Luis Valley of Colorado and through the middle Rio Grande Valley of New Mexico are for above average flows as compared to the base period 1948-1962. This was a relatively dry period as compared to longer flow records on the Rio Grande.

Storage in the upper basin in Colorado exceeds average and is among the higher years of record. El Vado reservoir serving the middle Rio Grande area is empty for repairs. Elephant Butte storage is only one quarter of capacity but relatively high as compared to recent years of record. Total storage in the basin equals or exceeds that for any of the past ten to fifteen years. Total surface water in prospect is slightly less than that for last year but more than for most recent years.

COLORADO BASIN

Snowfall to March 1 has been near to slightly less than average over the Upper Colorado River Basin. The greatest deficiency in snowpack is on the Green River watershed in Wyoming. There is a gradual increase south along the Continental Divide to the headwaters of the San Juan and Dolores Rivers where snowcover is slightly in excess of average. This area, along with southern Utah, benefitted from heavy snowfall in midwinter. On the extreme headwaters of the Colorado River above Glenwood Springs there is also an area of deficient snowpack.

Locally in Colorado no water shortages are anticipated except for late season in small tributary streams without storage.

The flow of Green River tributaries in northern Utah is expected to be slightly in excess of average during the snowmelt

SELECTED STREAMFLOW FORECASTS APRIL-SEPTEMBER 1966 as of MARCH 1, 1966

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW	FORECAST	
UPPER MISSOURI	1965	1966	
Jefferson at Sappington, Montana		825	85
Madison near Grayling, Montana 1/	577	400	95
Gallatin near Gateway, Montana		385	86
Missouri near Zortman, Montana 2/		3670	81
Sun at Gibson Dam, Montana 3/	702	565	93
Marias near Shelby, Montana 4/		620	95
Milk near Eastern Crossing, Montana (Mar.-July)	352	260	96
Yellowstone at Livingston, Montana		1920	90
Shields at Clyde Park, Montana		850	86
Clark Fork at Chance, Montana		520	89
Shoshone, Inflow to Buffalo Bill Res., Wyo.		565	70
Wind at Dubois, Wyoming		65	65
Bull Lake near Lenore, Wyoming		140	79
Tensleep near Tensleep, Wyoming		39	54
Yellowstone at Miles City, Montana 5/		4260	74
Missouri near Williston, N. Dakota 6/		8200	74
PLATTE			
North Platte at Saratoga, Wyoming		470	73
Laramie near Jelm, Wyoming 7/		90	80
Clear at Golden, Colorado		115	86
St. Vrain at Lyons, Colorado		55	69
Cache LaPoudre near Fort Collins, Colorado 8/		200	81
ARKANSAS			
Arkansas at Salida, Colorado 9/		252	73
Purgatoire at Trinidad, Colorado		33	73
RIO GRANDE			
Rio Grande near Del Norte, Colorado 10/		575	111
Conejos near Mogote, Colorado 11/		225	113
Rio Chama near LaPuente, New Mexico		210	98
Rio Grande at Otowi Bridge, New Mexico 12/		825	138
Pecos at Pecos, New Mexico *		75	140
UPPER COLORADO			
Colorado near Granby, Colorado 13/		195	84
Colorado near Glenwood Springs, Colorado 14/		1200	78
Roaring Fork at Glenwood Springs, Colorado 15/		762	97
Gunnison at Grand Junction, Colorado		1350	103
Dolores at Dolores, Colorado		300	115
Colorado near Cisco, Utah	5442	3650	96
Green below Flaming Gorge Res., Utah 16/ **	1251	850	75
Yampa at Steamboat Springs, Colorado		250	86
White at Meeker, Colorado		300	90
Duchesne near Tabiona, Utah 17/		97	85
Rock Creek near Mountain Home, Utah		95	93
Price near Scofield, Utah 18/		31	84
Green at Green River, Utah 16/		2300	68
San Juan near Rosa, New Mexico		725	125
Animas at Durango, Colorado		550	121
San Juan near Bluff, Utah 19/	2090	1430	122
Colorado, Inflow to Lake Powell, Arizona 20/ **	11810	7100	92
LOWER COLORADO			
Gila near Solomon, Arizona (Mar-May)	69	202	260
Salt at Intake, Arizona (Mar-May)	396	385	175
Verde above Horseshoe Dam, Arizona (Mar-May)	366	175	155

SELECTED STREAMFLOW FORECASTS APRIL-SEPTEMBER 1966 as of MARCH 1, 1966

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW	FORECAST	
GREAT BASIN	1965	1966	
Bear at Harer, Idaho		258	100
Logan near Logan, Utah 21/	183	112	84
Ogden, Inflow to Pine View Res., Utah 22/(Mar-July)	161	130	101
Weber near Oakley, Utah	188	112	91
Inflow to Utah Lake, Utah	381	280	99
Big Cottonwood near Salt Lake City, Utah	48	37	95
Beaver near Beaver, Utah	16	24	99
South Fork Humboldt near Elko, Nevada	93	57	95
Humboldt at Palisades, Nevada **	247	140	81
Truckee at Farad, California 25/**	320	284	105
East Carson near Gardnerville, Nevada **	235	185	103
West Walker near Coleville, California **	186	150	107
Owens, below Long Valley Dam, California			
UPPER COLUMBIA			
Columbia at Revelstoke, British Columbia			
Kootenai at Wardner, British Columbia			
Kootenai at Leonia, Idaho	9131	9900	106
Flathead near Columbia Falls, Montana 26/	7472	6080	93
Flathead near Polson, Montana 26/	9216	7200	93
Clark Fork above Missoula, Montana	2554	1420	77
Bitterroot near Darby, Montana	724	450	77
Clark Fork at Whitehorse Rapids, Montana 26/	17390	12650	88
Columbia at Birchbank, British Columbia 26/	43110	48100	111
Spokane at Post Falls, Idaho 27/		2600	76
Columbia at Grand Coulee, Washington 26/	69630	71000	101
Okanogan near Tonasket, Washington		1580	81
Chelan at Chelan, Washington 28/		1100	82
Wenatchee at Peshastin, Washington		1750	91
SNAKE			
Snake above Palisades Res., Wyoming 29/		2270	87
Snake near Heise, Idaho 29/		3300	85
Henry's Fork near Rexburg, Idaho 30/		1100	87
Big Lost near Mackay, Idaho 31/		160	85
Big Wood, Inflow to Magic Res., Idaho 32/		215	78
Bruneau near Hot Springs, Idaho		180	84
Owyhee Res., Net Inflow, Oregon		195	51
Boise near Boise, Idaho 33/		1300	80
Malheur near Drewsey, Oregon		37	45
Payette near Horseshoe Bend, Idaho 34/		1600	80
Snake at Weiser, Idaho		5700	82
Salmon at Whitebird, Idaho		6000	86
Clearwater at Spalding, Idaho		8000	87
LOWER COLUMBIA			
Grande Ronde at LaGrande, Oregon		127	63
Yakima at Cle Elum, Washington 35/		830	79
Deschutes at Benham Falls, Oregon 36/		515	82
Columbia at The Dalles, Oregon 26/		103500	95
Hood near Hood River, Oregon 36/		375	98
Willamette at Salem, Oregon 36/		5250	94
Lewis at Ariel, Washington 37/		1520	105
Cowlitz at Castle Rock, Washington		2900	98

Forecasts in California provided by Department of Water Resources.
Average is for 1948-62 period except California. California is computed for 1911-1960
Forecasts assume average Effective Climatic Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts Listed on Inside Back Cover.
** April - June Period ** April - July Period*

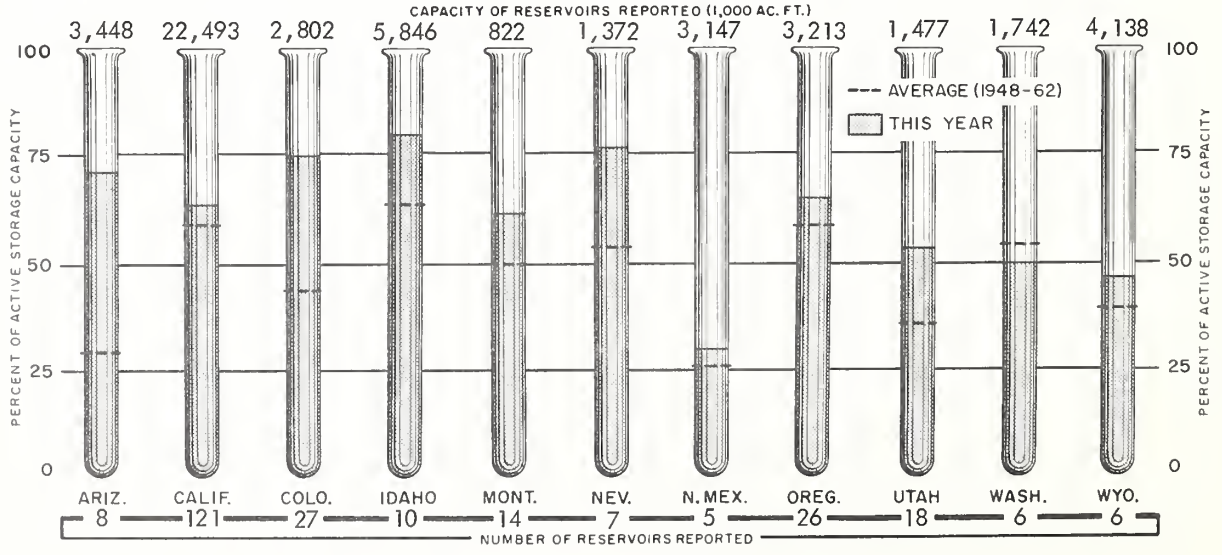
SELECTED STREAMFLOW FORECASTS APRIL-SEPTEMBER 1966 as of MARCH 1, 1966

STREAM AND STATION	1000 ACRE-FEET FLOW	1000 ACRE-FEET FORECAST	PERCENT OF AVERAGE
	1965	1966	
NORTH PACIFIC COASTAL			
Dungeness near Sequim, Washington		165	93
Rogue at Raygold, Oregon		1000	100
Klamath Lake, Net Inflow, Oregon.		540	84
CALIFORNIA CENTRAL VALLEY 38/**			
Sacramento, Inflow to Shasta, California	2030	1730	97
Feather near Oroville, California	2262	1720	89
Yuba at Smartville, California	1287	940	83
American, Inflow to Folsom Res., Calif.	1519	1180	85
Cosumnes at Michigan Bar, California	174	145	111
Mokelumne, Inflow to Pardee Res., Calif.	581	405	84
Stanislaus, Inflow to Melones Res., Calif.	880	620	84
Tuolumne, Inflow to Don Pedro Res., Calif.	1493	1020	84
Merced, Inflow to Excheque Res., Calif.	745	510	82
San Joaquin, Inflow to Millerton Lake, Calif.	1421	1010	83
Kings, Inflow to Pine Flat Res., California	1300	1090	93
Kaweah, Inflow to Terminus Res., California	314	215	82
Tule, Inflow to Success Res., California	64	30	54
Kern, Inflow to Isabella Res., California	456	300	71

Forecasts in California provided by Department of Water Resources.
Average is for 1948-62 period except California. California is computed for
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.
** April - June Period ** April - July Period*

RESERVOIR STORAGE as of MARCH 1, 1966



STORAGE IN LARGE RESERVOIRS

MARCH 1, 1966

BASIN AND NAME OF RESERVOIR	CAPACITY (1000 A.F.)	STORAGE (1000 A.F.)
UPPER MISSOURI		
Boysen	700	320
Buffalo Bill	373	270
Canyon Ferry	2043	1551
Hebgen	385	223
Tiber	1316	656
Belle Fourche	185	152
Keyhole	330	126
Fort Peck	19105	16700
Fort Randall	6100	2400
Garrison	24500	12485
Oahe	23600	9157
PLATTE		
Glendo	786	370
Pathfinder	1015	469
Seminoe	1011	399
City of Denver (6)	588	503
Colo-Big Thompson (4)	865	515
ARKANSAS		
Conchas	280	260
John Martin	367	376
RIO GRANDE		
Elephant Butte	2207	538
El Vado	367	2
UPPER COLORADO		
Flaming Gorge	3789	2389
Navajo	1709	216
Powell	28040	8748
LOWER COLORADO		
Havusu	619	544
Mead	27209	15589
Mohave	1709	1699
San Carlos	1206	410
Salt River Res. (4)	1755	1587
Verde River Res. (2)	322	265
GREAT BASIN		
Bear	1421	1145
Lahontan	286	213
Rye Patch	179	179
Sevier Bridge	236	110
Strawberry	270	118
Tahoe	732	540
Utah	1149	713

BASIN AND NAME OF RESERVOIR	CAPACITY (1000 A.F.)	STORAGE (1000 A.F.)
UPPER COLUMBIA		
Chelan	676	172
Coeur d'Alene	238	48
Flathead	1791	918
Hungry Horse	2982	1825
Kootenay	673	310
Pend Oreille	1155	959
Roosevelt	5232	1730
LOWER COLUMBIA		
Cougar	155	17
Detroit	300	24
Hills Creek	200	25
Lookout Point	337	24
Yakima Res. (5)	1066	700
SNAKE		
American Falls	1700	1287
Arrowrock	287	266
Anderson Ranch	423	353
Brownlee	980	265
Cascade	653	446
Jackson	847	696
Lucky Peak	278	232
Palisades	1202	1018
Owyhee	715	585
PACIFIC COASTAL		
Cachuma	205	190
Casitas	254	86
Clair Engle	2500	2051
Clear Lake	440	221
Nacimiento	350	207
Ross	1203	
Upper Klamath	584	328
CALIFORNIA CENTRAL VALLEY		
Almanor	1036	612
Berryessa	1602	1617
Comanche	432	128
Don Pedro	290	150
Folsom	1010	622
Hetch-Hetchy	360	166
Isabella	570	168
McClure	281	168
Millerton	521	402
Pine Flat	1013	621
Shasta	4500	3483

Reservoir Storage Data Provided by Bureau of Reclamation, Corps of Engineers, Geological Survey, and water using organizations. Data from California and British Columbia provided by Department of Water Resources and Department of Lands, Forests and Water Resources, respectively.

season. Streamflow along with storage will provide a satisfactory water supply for most irrigated areas. Forecasts have been lowered in this area because of light February snowfall.

The flow of the Virgin and Sevier rivers in southern Utah is expected to be well in excess of average this snowmelt season.

For Central Arizona, water supply outlook is the best in 25 years. All major reservoirs except San Carlos are expected to fill or are already full. Salt River Project Reservoirs are being held at about 90 percent of capacity with some spilling of water.

Winter streamflow has been unusually high. Flows during the snowmelt period, March through May, are also expected to be well in excess of average. Early irrigation has been encouraged to provide for storage space in Salt and Verde River reservoirs.

Storage in Lakes Mead, Powell, Navajo and Flaming Gorge is substantially higher than for a year ago on this date. Total storage now approximates 27,000,000 acre feet. Inflow forecasts this year furing the snowmelt season are 90 percent of average for Lake Powell, roughly two-thirds of that for 1965. An above average snowfall in the Colorado River headwaters for the remaining season is desirable.

GREAT BASIN

Irrigation water supply outlook is favorable over the Great Basin. With light February snowfall there has been some decreases in streamflow forecasts from a month ago. Seasonal snow accumulation to date ranges from 80 to 100 percent of average with slightly less on the Humboldt in Nevada and the Harney Basin in Oregon.

Streamflow forecasts are for near average snowmelt season flows both from the Wasatch Range in Utah and the east slope of the Sierras in western Nevada. In these areas, also, carryover storage from a year ago will provide adequate supplemental water.

If late season snowfall is below average, some water shortage may occur north of the main Humboldt in northeastern Nevada and in the Harney Basin of Oregon where limited or no storage is available.

COLUMBIA BASIN

Snow accumulation to March 1 is below average for most of the Columbia Basin. Snow surveys by the British Columbia Water Resources Service on March 1 shows that mountain snowpack was close to average on the Fraser, North and South Thompson, Columbia, Kootenay, Okanogan, Similkameen and Skagit basins. Exception from this average trend is the heavy March 1 snowpack on the Vancouver North Shore and Vancouver Island watersheds. British Columbia experienced lighter than usual precipitation and warmer than usual temperature during February. Most B.C. meteorological stations have recorded below to well below normal precipitation with mean monthly temperatures ranging from 2 to 9 degrees above normal.

A limited area of above average snowfall has occurred on the Lewis River watershed in Washington and on the Willamette in Oregon. On the Snake River watershed snowfall has been generally deficient and especially so on the southern tributaries through Idaho, on the Boise River, and on the Owyhee and Malheur watersheds in eastern Oregon and adjacent areas of Idaho and Nevada.

Streamflow forecasts along the Snake River are more favorable than indicated by the snowpack because of wet soils in the mountains.

Storage for irrigation purposes in all areas of the basin is high with the exception of the Yakima and Okanogan tributaries in Washington. Yakima reservoirs are expected to fill during the snowmelt period. Storage in power reservoirs is declining rapidly because of low natural streamflow during the winter months.

With storage and streamflow the outlook for irrigation is satisfactory with a minor exception of the Bitterroot in Montana where late season shortages may occur.

The flow of the Columbia at The Dalles, Oregon is forecast to flow 103,500,000 acre feet or 95% of average, about five percent less than that which occurred in 1965.

ALASKA

March 1 snow surveys indicate a generally heavy snow cover on the Chena and Tanana drainages east of Fairbanks. From limited records of about five years, some snowwater equivalents are double the previous high records. Snow depths and densities are light in the watersheds of the Susitna and Copper rivers, south of the Alaska Range. Water equivalent of the snowpack on the Snettisham drainage area of southeast Alaska is slightly greater than a year ago, the first year of surveys in this area.

CALIFORNIA

The California Department of Water Resources, coordinating agency for snow surveys and water supply forecasting in California, reports that a dry February has resulted in a general normalizing of those factors contributing to the state's water supply. Although showing a significant reduction from the February situation reported one month ago, snowpack and surface reservoirs remain generally above normal for this date. These factors, which are dominant in determining water conditions, continue to assure the state's water users adequate water supplies during the 1966 water year.

Precipitation during February was below normal throughout the state except for the Colorado Desert area, which received near normal rainfall amounts for the month. Precipitation varies from 20 percent of the normal in the Lahontan area to 65 percent of normal in the San Francisco Bay and north coastal areas. The San Joaquin and Sacramento Valleys received 50 and 60 percent of normal respectively.

After very heavy early season precipitation, California has experienced two consecutive relatively dry months. The sub-normal January and February months that normally produce a large part of the year's water crop has reduced the state wide, season to date precipitation to near normal. The area south of the Tehachapis, with precipitation totals the same basis approaching 900 percent of normal after the November deluge is now averaging about 165 percent.

Measurements on or about March 1 show that the lower elevation snowpack is relatively high with respect to normal due to cold storms and subsequent below normal temperatures. These measurements indicate that the statewide snowpack water content was 105 percent of the March 1 average or 95 percent of the April 1 average. The water content ranges from a high of 145 percent on the Shasta river to a low of 85 percent on the Kern river.

March 1 forecasts for most California river basins are down from those made one month ago and total water year runoff from California streams is now expected to be only about 90 percent of normal. Assuming normal precipitation for the remainder of the season, most streams in the central valley are forecasted to produce below normal runoff during the April-July period also. The pattern of these forecasts for this period range from near normal in the northern Sacramento valley to some deficiencies of 15 to 20 percent in the San Joaquin valley. Extreme deficiencies are indicated only in the Tule and Kern river basins, where April-July runoff will be about 55 and 70 percent of normal, respectively.

Runoff during February in California averaged only 55 percent of normal. The runoff pattern reflected the below normal temperature as well as the sub-normal precipitation during the past two months, especially on Sierra watersheds. Runoff from coastal streams ranged from about 85 percent of normal in the north coastal area to 30 percent of normal in the central coastal area. Streams tributary to the central valley averaged 55 percent of normal with deficiencies from normal for the month ranging from 25 percent in the upper Sacramento river basin up to almost 65 percent for several basins in both the Sacramento and San Joaquin Valleys.

EXPLANATION of STREAMFLOW FORECASTS

All flows are observed flows except as adjusted for: 1/ Change in storage in Hebgen Lake. 2/ Change in storage in Canyon Ferry and Tiber reservoirs. 3/ Change in storage in Gibson Reservoir and measured diversions. 4/ Change in storage in Two Medicine, Four Horns and Lake Francis reservoirs. 5/ Change in storage in Boysen and Buffalo Bill reservoirs.

6/ Change in storage in Boysen, Buffalo Bill, Canyon Ferry, Tiber, and Fort Peck reservoirs. 7/ Plus diversions to Cache la Poudre. 8/ Minus diversions from North Platte, Laramie, and Colorado rivers plus measured diversions above station. 9/ Change in storage in Twin Lakes and Sugar Loaf reservoirs minus diversions from Colorado River.

10/ Change in storage in Rio Grande, Santa Maria, and Continental reservoirs. 11/ Change in storage in Platoro Reservoir. 12/ Change in storage in El Vado Reservoir. 13/ Change in storage in Granby Reservoir plus diversions to Cache la Poudre and through Adams Tunnel. 14/ Changes as indicated in (13) plus Moffatt Tunnel diversion. 15/ Plus diversions to Arkansas River.

16/ Change in storage in Flaming Gorge and Big Sandy reservoirs. 17/ Plus diversion through Duchesne Tunnel. 18/ Change in storage in Scofield Reservoir. 19/ Change in storage in Navajo Reservoir. 20/ (Lee's Ferry) Change in storage in Flaming Gorge, Navajo, Lake Powell, and Big Sandy reservoirs.

21/ Plus Utah Power and Light Company tailrace and Logan, Hyde Park, and Smithfield canals. 22/ (Inflow record computed by U. S. Bureau of Reclamation.) 23/ Plus diversion by Weber-Provo Canal and change in storage in Wanship Reservoir. 24/ Change in storage in Deer Creek Reservoir, minus diversions through Duchesne Tunnel and Weber-Provo Canal, plus diversion through Salt Lake City Aqueduct. 25/ Change of storage in Lake Tahoe and Boca Reservoir. (Forecast by Truckee Basin Committee)

26/ Change in storage in any of these reservoirs above the station: Kootenai Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee and Noxon; and pumpage at Roosevelt Lake. 27/ Changes in storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie canals. 28/ Change in storage in Lake Chelan. 29/ Changes in storage for Jackson Lake and Palisades Reservoir above stations. 30/ Change in storage in Henry's Lake, Island Park and Grassy Lake reservoirs and diversions between Ashton and Rexburg.

31/ Change in storage in Mackay Reservoir, and diversion in Sharp Ditch. 32/ (Combined flow Big Wood River nr. Bellevue and Camas Creek nr. Blaine.) 33/ Change in storage in Arrowrock, Anderson Ranch, and Lucky Peak. 34/ Change in storage in Cascade and Deadwood reservoirs. 35/ Change in storage in Keechelus, Kachess, and Cle Elum reservoirs plus diversion by Kittitas Canal. 36/ (Corrected to natural flow). 37/ Change in storage in Merwin, Yale, and Swift reservoirs. 38/ (Corrected for upstream impairments).

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